ADM- 10.1
Corresp.

DD/S&T 2429-65
27 AUG 1965

STATINTL

[redacted]

Dear John:

Your letter of 9 August 1965 was waiting for me when I returned from vacation on Cape Cod yesterday. Its substance is quite valuable and we are busy digesting it in our Scientific Intelligence Unit. Many thanks for the vacuum cleaning you put on.

Sincerely,

[redacted] STATINTL

Albert D. Wheelon
Deputy Director

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ADM-10.1 Corresp

DD/ST# 3638-65

August 9, 1965

Dr. Albert D. Wheelon
2430 E Street, N. W.
Washington, D. C.

Dear Dr. Wheelon:

When Goldanskii visited our lab, I was laid up in bed with a bad back. I delegated your questions to my colleague, Dr. Shu-Jen Tao. One evening of G.'s visit he had dinner with Dr. Tao and myself at my house. I "entertained" from bed.

The information ascertained is as follows, as per Goldanskii:

The USSR Mossbauer Effect (ME) instrumentation has about the same accuracy as ours. With a combination of techniques they can measure 2Å. The Soviets are using ME elements in their detectors to improve efficiency. No equivalent of commercial production of ME instrumentation exists according to G. Each institution makes their own instruments. They are very enthused about using ME as mineral detectors for e.g., tin.

G. states ME is "powerless" in studying the behavior of electrons in solids and its use in the solid state is limited to

(1) Study of nuclear moment.

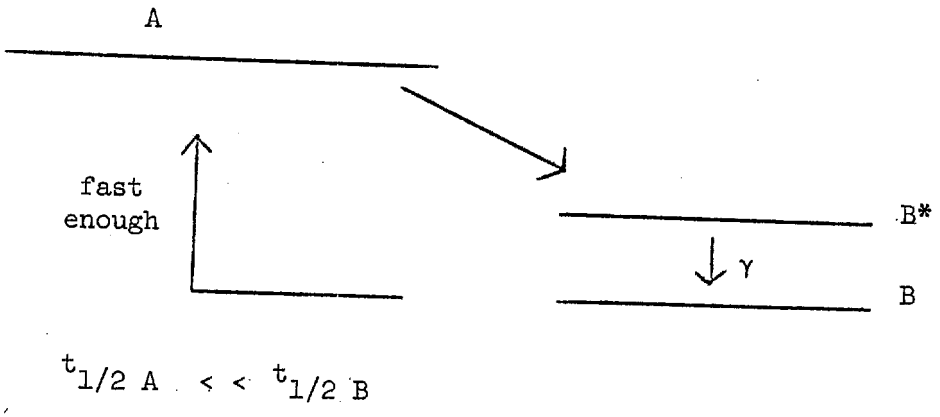
(2) Distortion of S-electron waves.

(3) Behavior of ferromagnetic elements and crystal lattice because of Zeeman splitting.

(4) Study of ME elements on the surface of solids.

G. states that ME is definitely possible for γ laser effects. The impression is that they are actively working on this problem. G. states the difficulty arises in finding a suitable

decay scheme where the lifetime of the parent element is much less than the lifetime of the excited daughter elements, and the excitation to the parent element should be quite efficient. G. illustrated by the following diagram:



He ducked the question of another all Union conference on ME. He did state that he sees a bright future in ME in studying chemical physics -- far greater than its study of the solid state.

The evening we were together I tried an oblique approach to the subject of rocket propellants. I believe the data below may be useful.

1. He stated that he found the work of Dr. Tao's on gases the most interesting positronium work that he heard here. G. stated he is going to concentrate his own work with positrons on gases.

2. He stated he felt it was an ideal tool to study high energy, fast reactions in gases.

3. He further stated that he thought it was also excellent to study high energy, fast reactions in gases derived from the condensed state.

4. He indicated that he would have to modify his instrumentation to obtain better resolution time. He claims he now has 3 nanoseconds. From his statements about his results, we feel it is probably closer to 0.8 nanoseconds.

5. He wants to remodel his system along the lines of our gear. His current rig is not solid state.

6. He is very taken by our results indicating "fine structure" in positron lifetimes in gases.

7. He feels that the "big" future of positronium will be as a measuring tool for chemical reactions.

I suspect that his above statements were made by him with a study of propellant systems in mind. The USSR has used positrons in plasma studies.

Net impression: He is smart, canny and shrewd. He is a vacuum cleaner to absorb information. He is typically difficult when one tries to obtain information. This must be done by indirection. He is strongly taken by materialistic artifacts and advantages, e.g., swimming pools, remote control TV, good stereo, the potential of vacationing in Florida in the winter. He was far more susceptible to material "goodies" than a good Soviet should be. Conceivably, one might capitalize on this.

I trust this has been useful.

Sincerely,

John H. Heller